DMX REFERENCE

Alpha H500

BHL Technologies



Manufacturer	BHL Technologies
GDTF file	BHL_Technologies_Alpha_H500_158609.gdtf
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1 About this manual

This document describes the Alpha H500 by BHL Technologies. It was compiled from the GDTF file BHL_Technologies_Alpha_H500_158609.gdtf from the GDTF-Share library.

File revision: “V002”.

The DMX modes, the channel functions and the technical data are given as the GDTF file states them. Installation, operation from the device's control panel, service and safety instructions are described in the manufacturer's original user manual, which takes precedence over this document.

This document was not issued or endorsed by BHL Technologies; product names and trademarks belong to their owners.

Safety notices are marked with signal words according to the severity of the hazard: DANGER – an imminent hazard that will result in death or serious injury; WARNING – a potential hazard that could result in death or serious injury; CAUTION – a potential hazard that could result in minor injury or property damage; NOTE – additional information for correct and safe use.

> **NOTE** This product is designed for stage and effect lighting. It is not suitable for household room illumination.

2 Quick reference

Parameter	Value
Power consumption	600 W
Weight	23 kg

DMX modes

Mode	Channels	Units in one universe	First start addresses
32Ch	32	16	1, 33, 65, 97, ...
26Ch	26	19	1, 27, 53, 79, ...

No light? Check these channels

- 32Ch: CH 6 Dimmer above 0; CH 8 Shutter at 104–107, 208–212 or 252–255 “Open”
- 26Ch: CH 6 Dimmer above 0; CH 8 Shutter at 104–107, 208–212 or 252–255 “Open”


Read the manual before use


Risk of electric shock


Do not stare into the light


Indoor use only

3 Safety instructions


Read the manual before use


Risk of electric shock


Do not stare into the light


Indoor use only

⚠ WARNING

- This device is intended for professional use. Installation, connection, setup and maintenance must be carried out only by suitably qualified persons who have read this manual.
- Use the device only for its intended purpose and as described in this manual.
- Do not open the housing and do not modify or tamper with the device. Refer all repairs to an authorized service center.
- Do not use the device if its housing, power or data cable, or a connector is damaged, if the device has been dropped, or if liquid or a foreign object has entered it. In such a case, have it checked by a service center.
- Disconnect the device from the power supply before cleaning, maintenance or any work on the connections.
- After moving the device from a cold to a warm environment, let it reach room temperature before switching it on to prevent condensation inside.
- The device is not a toy; keep it out of the reach of children.

⚠ WARNING

- Connect the device only to a properly installed mains outlet with a protective earth (ground) contact. The outlet or other means of disconnection must remain easily accessible.
- Power supply: 110–240 V, 50/60 Hz. Before connecting, make sure that the mains voltage matches this value and the value on the rating plate of the device.
- Do not connect the device to a dimmer or to a dimmed circuit.
- Use only the original power cable or a cable with identical ratings. Protect the cable from damage, do not run it over sharp edges, and never unplug it by pulling on the cable.
- When connecting several devices to one circuit, do not exceed its permitted load.
- Do not touch the device with wet hands.

⚠ WARNING

- This device is designed for indoor use only. Protect it from rain, splashing water, moisture and dust, and do not place containers with liquids on it.
- Do not operate the device in high humidity, near water, or where condensation can form on it.

⚠ CAUTION

- This device emits intense light. Do not look directly into the light source or the beam at close range; doing so may damage your eyes.
- Do not aim the beam at the eyes of people or animals at close range, and do not view the light source through optical instruments (binoculars, camera lenses).
- Do not aim the beam at flammable or heat-sensitive materials at close range.

> ⚠ **CAUTION**
>
> - Strobe and fast flashing light effects can trigger epileptic seizures in susceptible people (photosensitive epilepsy) and can cause nausea or disorientation.
> - Inform the audience and performers in advance that strobe effects will be used, for example with a notice at the entrance, and do not use them longer than necessary.

> ⚠ **WARNING**
>
> - The moving parts of the device (for example the head or arms) can move quickly and unexpectedly at any time – after power-on, during a reset, or on a command from the controller.
> - Keep yourself and any objects out of the range of movement. While the device is switched on, do not touch the moving parts, move them by hand, or obstruct their movement; this can cause injury (pinching) and damage the drive.
> - Do not carry the device by its moving parts. If the device has a transport lock, engage it before transport and release it before switching on.

4 Product description

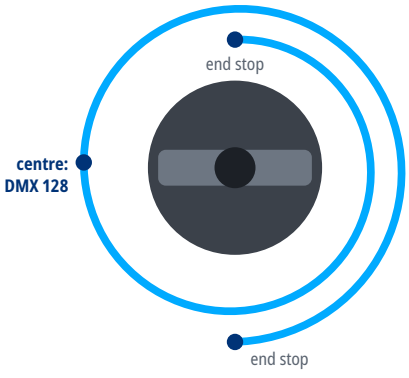
Description in the GDTF file

“500W LED Hybrid Movinghead with CMY and CTO”

Range of movement

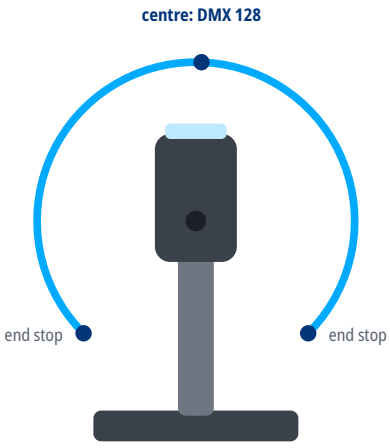
Pan 540°

top view



Tilt 270°

side view



5 Installation

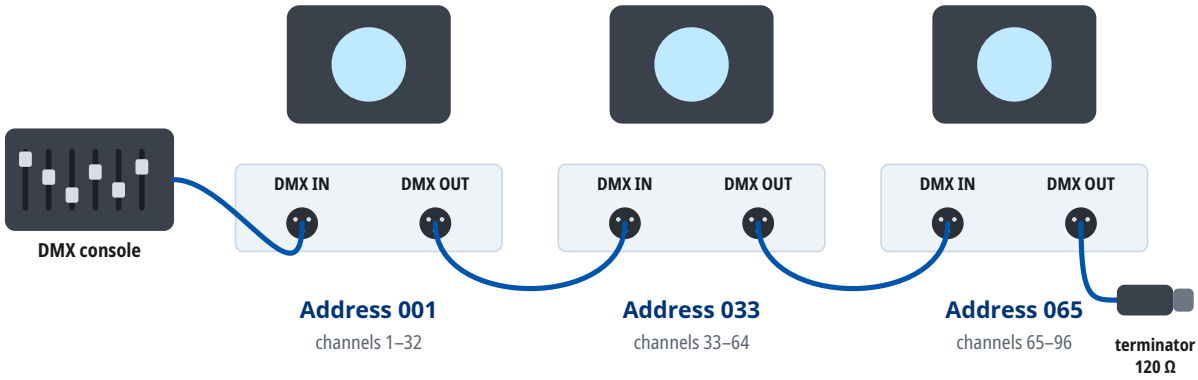
⚠ **WARNING**

- Rigging must be carried out only by qualified persons in accordance with applicable regulations, in particular those for work at height.
- The supporting structure and fixings must safely carry the weight of all suspended devices; verify their load capacity in advance.
- Weight of the device: 23 kg.
- Use suitable mounting hardware (for example truss clamps) and tighten all screw connections properly.
- Always secure the suspended device against falling with a safety cable of adequate load capacity, routed through a fixed point of the device and around the supporting structure.
- During installation and removal, keep people out of the area below the work position.
- Regularly inspect the fixings and the safety cable for damage, corrosion and loosening.

6 Connections

- Use shielded cable designed for DMX512 with an impedance of 110 Ω. Ordinary microphone cable is not suitable for DMX, especially over longer distances.
- Connect the devices in a daisy chain: connect the DMX OUT of one device to the DMX IN of the next. Do not split the line with Y-cables or wire it in a star; the line may be split only with a DMX splitter.
- Connect the shield to pin 1 only. Do not connect the shield (ground) to the metal shell of the connector; this can cause short circuits or erratic behavior.
- XLR pin assignment: pin 1 – shield (ground), pin 2 – Data- (Data Complement), pin 3 – Data+ (Data True). On 5-pin connectors, pins 4 and 5 are not connected; a 5-pin connector can be connected to a 3-pin one with a cable adapter.
- Terminate the end of the line (for impedance matching): plug an XLR connector with a 120 Ω, ¼ W resistor between pins 2 and 3 into the DMX OUT of the last device. This reduces the risk of erratic behavior.
- Connect no more than 32 devices to one DMX line. For more devices or longer runs, use a DMX splitter or booster.

DMX line



Mode 32Ch: every unit occupies 32 channels from its address. At most 32 units on one line; for more units or longer runs use a DMX splitter. A 120 Ω terminator closes the last DMX OUT.

7 Operation

Setting the DMX address

- The device occupies as many consecutive channels in the DMX universe as the selected DMX mode uses, starting at the set start address.
- Number of channels occupied in the DMX mode “32Ch”: 32.
- Choose start addresses so that the channels of individual devices do not overlap and the last occupied channel does not exceed 512. Devices with the same start address and mode respond identically.
- For several devices in a row in the DMX mode “32Ch”, you can use, for example, the start addresses 1, 33, 65, 97.
- The DMX mode set on the device must match the fixture profile (personality) used in the controller.
- The device supports RDM (Remote Device Management), two-way communication with the controller over the DMX line.

8 Functions at a glance

Functions in each DMX mode

	32Ch 32 channels	26Ch 26 channels
Pan / Tilt	1, 3	1, 3
Dimmer	6	6
Shutter / strobe	8	8
Color mixing	13, 15, 17	12–14
Color temperature	11	11
Color wheel	9	9
Gobo wheel	19, 20	15, 16
Gobo rotation	21	17
Prism	27–30	21–24
Frost	31	25
Zoom	23	18
Focus	24, 26	19, 20

Gobo wheel 1



1. Static Gobos: Medium — DMX 5–9
2. Static Gobos: Small — DMX 0–4
3. Static Gobos: Small Dots — DMX 10–14
4. Static Gobos: Diverse Dots — DMX 15–19
5. Static Gobos: Parallel Lines — DMX 20–24
6. Static Gobos: Moon Cross — DMX 25–29
7. Static Gobos: Stripes — DMX 30–34
8. Dot Circle — DMX 35–39
9. Static Gobos: Scratches — DMX 40–44
10. Static Gobos: Square — DMX 45–49
11. Static Gobos: Fan — DMX 50–54
12. Open — DMX 55–60

Gobo wheel 2



1. Rotating Gobos: Open — DMX 0–9
2. Flower — DMX 10–19
3. Rotating Gobos: Tangent Circles — DMX 20–29
4. Rotating Gobos: Moons — DMX 30–39
5. Rotating Gobos: Diamonds — DMX 40–49
6. Rotating Gobos: Slashes — DMX 50–59
7. Rotating Gobos: Fine Dots — DMX 60–69
8. Leafes — DMX 70–80

Prism 1

1

No Prism
DMX 0–127

2



8 facets
Circular Prism
DMX 128–255

Prism 2

1

No Prism
DMX 0–127

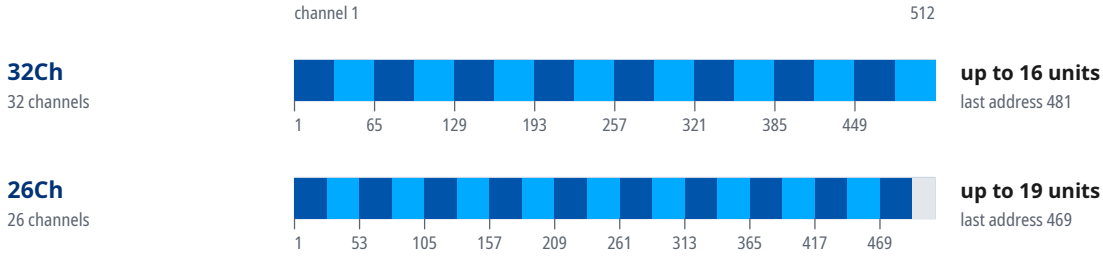
2



6 facets
Linear Prism
DMX 128–255

9 DMX channels

Units in one DMX universe



Start addresses of 20 units in the mode “32Ch”

Unit	Start address	Unit	Start address	Unit	Start address	Unit	Start address
1	1	6	161	11	321	16	481
2	33	7	193	12	353	17	U2 · 1
3	65	8	225	13	385	18	U2 · 33
4	97	9	257	14	417	19	U2 · 65
5	129	10	289	15	449	20	U2 · 97

Where a DMX universe is full, the next units continue in the next universe: “U2 · 1” is address 1 in the second universe, counted from the universe of the first unit.

RDM personalities

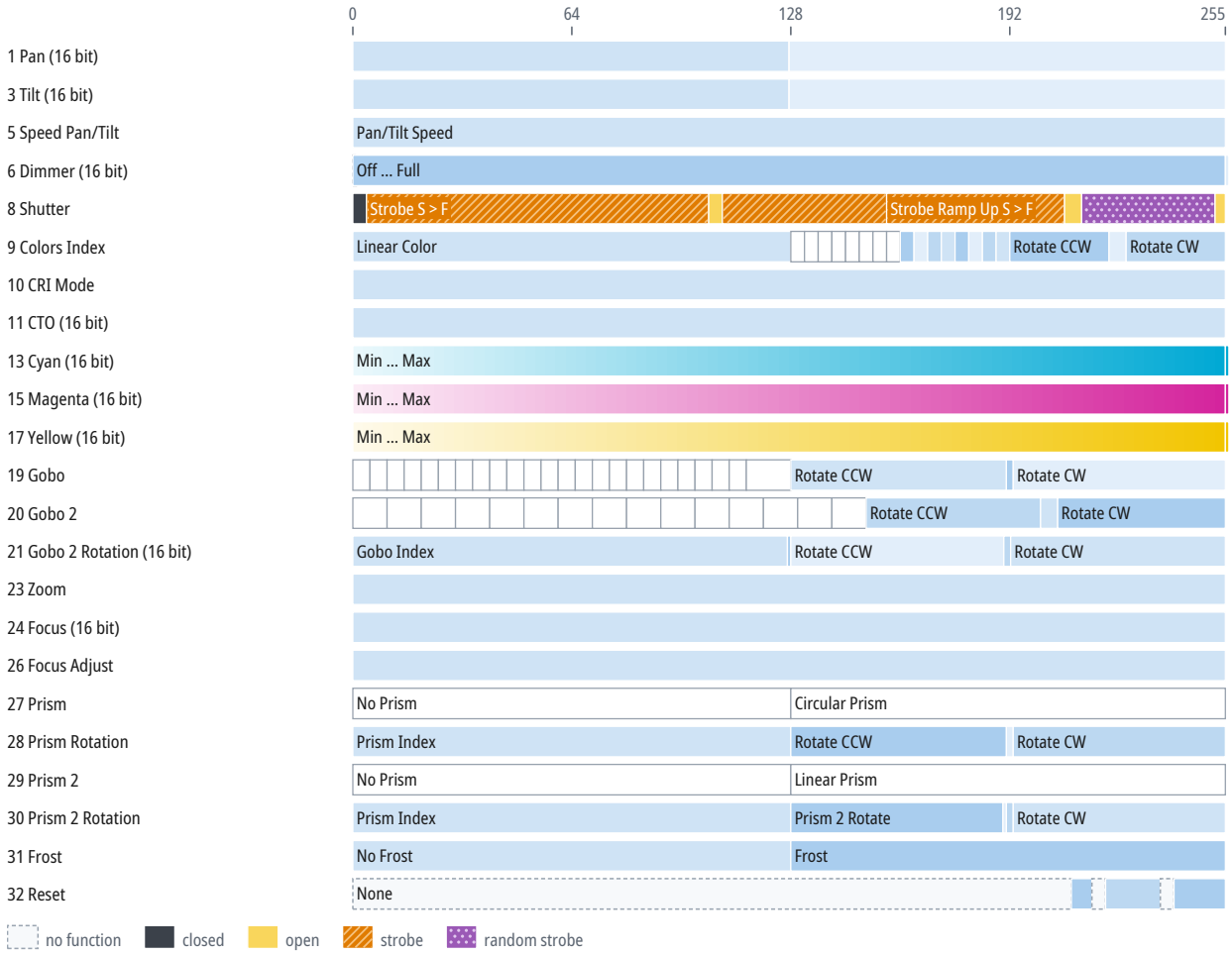
Mode	Channels	RDM personality
32Ch	32	2
26Ch	26	1

Mode 32Ch

16-bit parameters use two channels, coarse and fine: value = 256 × coarse value + fine value.

If the device receives DMX in this mode but gives no light, check these channels: CH 6 Dimmer above 0; CH 8 Shutter at 104–107, 208–212 or 252–255 “Open”. The GDTF file gives these values for a console's Highlight function: CH 6 Dimmer 255, CH 8 Shutter 255.

Channel functions at a glance



CH	Function	DMX	Description
1	Pan	0–127	Pan
		128	Center
		128–255	Pan
2	Pan Fine	0–255	Fine adjustment of CH 1
3	Tilt	0–127	Tilt
		128	Center
		128–255	Tilt
4	Tilt Fine	0–255	Fine adjustment of CH 3
5	Speed Pan/Tilt		Pan/Tilt Speed
		0–255	Pan/Tilt Speed
6	Dimmer	0–255	Off ... Full
		255	Full

CH	Function	DMX	Description
7	Dimmer Fine	0–255	Fine adjustment of CH 6
8	Shutter	0–3	Closed
		4–103	Strobe S > F
		104–107	Open
		108–155	Strobe Ramp Down S > F
		156–207	Strobe Ramp Up S > F
		208–212	Open
		213–251	Random Strobe S > F (0–20 Hz)
		252–255	Open
9	Colors Index	0–127	Linear Color
		128–131	Red
		132–135	Green
		136–139	Blue
		140–143	Orange
		144–147	Pink
		148–151	Yellow
		152–155	Light Blue
		156–159	CRI
		160–163	Open + Red
		164–167	Red + Green
		168–171	Green + Blue
		172–175	Blue + Orange
		176–179	Orange + Pink
		180–183	Pink + Yellow
		184–187	Yellow + Light Blue
		188–191	Light Blue + CRI
		192–220	Rotate CCW (180–0 °/s)
		221–225	Color 1 Wheel Spin: Stop
		226–255	Rotate CW (0–180 °/s)
10	CRI Mode	0–255	
11	CTO	0–255	
12	CTO Fine	0–255	Fine adjustment of CH 11
13	Cyan	0–255	Min … Max
		255	Max
14	Cyan Fine	0–255	Fine adjustment of CH 13
15	Magenta	0–255	Min … Max
		255	Max
16	Magenta Fine	0–255	Fine adjustment of CH 15
17	Yellow	0–255	Min … Max
		255	Max
18	Yellow Fine	0–255	Fine adjustment of CH 17
19	Gobo	0–4	Static Gobos: Small

CH	Function	DMX	Description
19	Gobo (continued)	5–9	Static Gobos: Medium
		10–14	Static Gobos: Small Dots
		15–19	Static Gobos: Diverse Dots
		20–24	Static Gobos: Parallel Lines
		25–29	Static Gobos: Moon Cross
		30–34	Static Gobos: Stripes
		35–39	Dot Circle
		40–44	Static Gobos: Scratches
		45–49	Static Gobos: Square
		50–54	Static Gobos: Fan
		55–59	Static Gobos: Open
		60–64	Gobo 1 Shake: Small (0–5 Hz)
		65–69	Gobo 1 Shake: Medium (0–5 Hz)
		70–74	Gobo 1 Shake: Small Dots (0–5 Hz)
		75–79	Gobo 1 Shake: Diverse Dots (0–5 Hz)
		80–84	Gobo 1 Shake: Parallel Lines (0–5 Hz)
		85–89	Gobo 1 Shake: Moon Cross (0–5 Hz)
		90–94	Gobo 1 Shake: Stripes (0–5 Hz)
		95–99	Dot Cirlce (0–5 Hz)
		100–104	Gobo 1 Shake: Scratches (0–5 Hz)
		105–109	Gobo 1 Shake: Square (0–5 Hz)
		110–114	Gobo 1 Shake: Fan (0–5 Hz)
		115–127	Gobo 1 Shake: Open (0–5 Hz)
		128–190	Rotate CCW (180–0 °/s)
		191–192	Gobo 1 Wheel Spin: Stop
		193–255	Rotate CW (0–180 °/s)
20	Gobo 2	0–9	Rotating Gobos: Open
		10–19	Flower
		20–29	Rotating Gobos: Tangent Circles
		30–39	Rotating Gobos: Moons
		40–49	Rotating Gobos: Diamonds
		50–59	Rotating Gobos: Slashes
		60–69	Rotating Gobos: Fine Dots
		70–79	Rotating Gobos: Leafes
		80–89	Dots Circle
		90–99	Gobo 2 Shake: Tangent Circles
		100–109	Gobo 2 Shake: Moons
		110–119	Gobo 2 Shake: Diamonds
		120–129	Gobo 2 Shake: Slashes
		130–139	Gobo 2 Shake: Fine Dots
		140–149	Gobo 2 Shake: Leafes
		150–200	Rotate CCW (180–0 °/s)

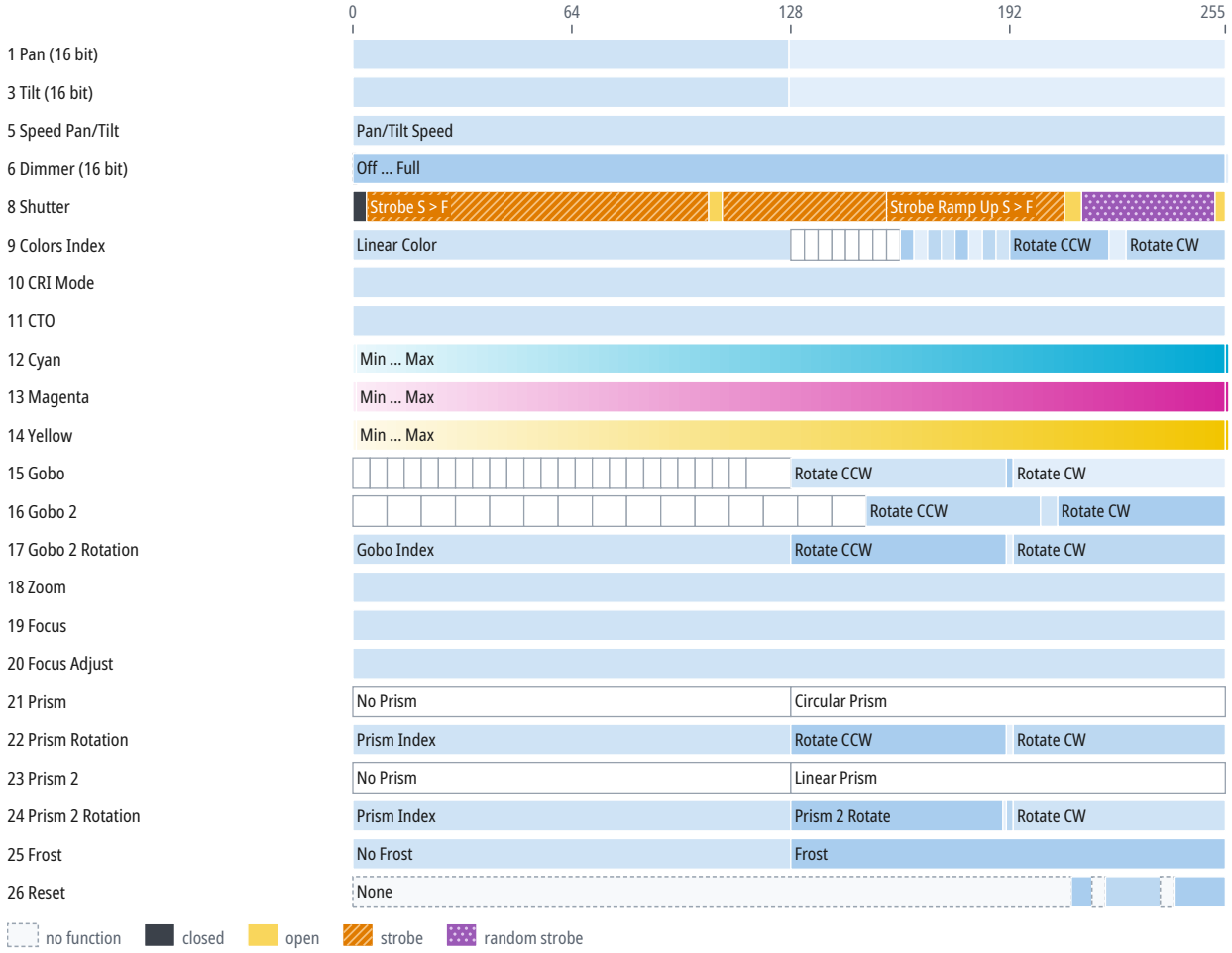
CH	Function	DMX	Description
20	Gobo 2 (continued)	201–205	Gobo 2 Wheel Spin: Stop
		206–255	Rotate CW (0–180 °/s)
21	Gobo 2 Rotation	0–127	Gobo Index
		127–128	Gobo Rotation
		128–190	Rotate CCW (360–0 °/s)
		191–192	Gobo 2 Rotate: Stop
		193–255	Rotate CW (0–360 °/s)
22	Gobo 2 Rotation Fine	0–255	Fine adjustment of CH 21
23	Zoom	0–255	4–50°
24	Focus	0–255	
25	Focus Fine	0–255	Fine adjustment of CH 24
26	Focus Adjust	0–255	
27	Prism		Static Prism
		0–127	No Prism
		128–255	Circular Prism
28	Prism Rotation	0–127	Prism Index (360°)
		128–190	Rotate CCW (360–0 °/s)
		191–192	Prism 1 Rotate: Stop
		193–255	Rotate CW (0–360 °/s)
29	Prism 2		Circular Prism
		0–127	No Prism
		128–255	Linear Prism
30	Prism 2 Rotation	0–127	Prism Index (360°)
		128–189	Prism 2 Rotate
		190	Rotate CCW (360–0 °/s)
		191–192	Prism 2 Rotate: Stop
		193–255	Rotate CW (0–360 °/s)
31	Frost	0–127	No Frost
		128–255	Frost
32	Reset	0–209	None
		210–215	Reset Pan/Tilt Motor After 4s
		216–219	None
		220–235	Reset Effect Motors After 4s
		236–239	None
		240–255	Reset All After 4s

Mode 26Ch

16-bit parameters use two channels, coarse and fine: value = 256 × coarse value + fine value.

If the device receives DMX in this mode but gives no light, check these channels: CH 6 Dimmer above 0; CH 8 Shutter at 104–107, 208–212 or 252–255 “Open”. The GDTF file gives these values for a console's Highlight function: CH 6 Dimmer 255, CH 8 Shutter 255.

Channel functions at a glance



CH	Function	DMX	Description
1	Pan		Same as CH 1 in the mode “32Ch” (p. 11)
2	Pan Fine	0–255	Fine adjustment of CH 1
3	Tilt		Same as CH 3 in the mode “32Ch” (p. 11)
4	Tilt Fine	0–255	Fine adjustment of CH 3
5	Speed Pan/Tilt		Same as CH 5 in the mode “32Ch” (p. 11)
6	Dimmer		Same as CH 6 in the mode “32Ch” (p. 11)
7	Dimmer Fine	0–255	Fine adjustment of CH 6
8	Shutter		Same as CH 8 in the mode “32Ch” (p. 12)
9	Colors Index		Same as CH 9 in the mode “32Ch” (p. 12)
10	CRI Mode	0–255	
11	CTO	0–255	
12	Cyan	0	Min

CH	Function	DMX	Description
12	Cyan (continued)	1–254	Min … Max
		255	Max
13	Magenta	0	Min
		1–254	Min … Max
		255	Max
14	Yellow	0	Min
		1–254	Min … Max
		255	Max
15	Gobo	0–4	Static Gobos: Small
		5–9	Static Gobos: Medium
		10–14	Static Gobos: Small Dots
		15–19	Static Gobos: Diverse Dots
		20–24	Static Gobos: Parallel Lines
		25–29	Static Gobos: Moon Cross
		30–34	Static Gobos: Stripes
		35–39	Static Gobos: Dot Circle
		40–44	Static Gobos: Scratches
		45–49	Static Gobos: Square
		50–54	Static Gobos: Fan
		55–59	Static Gobos: Open
		60–64	Gobo 1 Shake: Small (0–5 Hz)
		65–69	Gobo 1 Shake: Medium (0–5 Hz)
		70–74	Gobo 1 Shake: Small Dots (0–5 Hz)
		75–79	Gobo 1 Shake: Diverse Dots (0–5 Hz)
		80–84	Gobo 1 Shake: Parallel Lines (0–5 Hz)
		85–89	Gobo 1 Shake: Moon Cross (0–5 Hz)
		90–94	Gobo 1 Shake: Stripes (0–5 Hz)
		95–99	Gobo 1 Shake: Dot Circle (0–5 Hz)
		100–104	Gobo 1 Shake: Scratches (0–5 Hz)
		105–109	Gobo 1 Shake: Square (0–5 Hz)
		110–114	Gobo 1 Shake: Fan (0–5 Hz)
		115–127	Gobo 1 Shake: Open (0–5 Hz)
		128–190	Rotate CCW (180–0 °/s)
		191–192	Gobo 1 Wheel Spin: Stop
		193–255	Rotate CW (0–180 °/s)
16	Gobo 2		Same as CH 20 in the mode “32Ch” (p. 13)
17	Gobo 2 Rotation	0–127	Gobo Index (360°)
		128–190	Rotate CCW (360–0 °/s)
		191–192	Gobo 2 Rotate: Stop
		193–255	Rotate CW (0–360 °/s)
18	Zoom	0–255	4–50°
19	Focus	0–255	

CH	Function	DMX	Description
20	Focus Adjust	0–255	
21	Prism		Same as CH 27 in the mode “32Ch” (p. 14)
22	Prism Rotation		Same as CH 28 in the mode “32Ch” (p. 14)
23	Prism 2		Same as CH 29 in the mode “32Ch” (p. 14)
24	Prism 2 Rotation		Same as CH 30 in the mode “32Ch” (p. 14)
25	Frost		Same as CH 31 in the mode “32Ch” (p. 14)
26	Reset		Same as CH 32 in the mode “32Ch” (p. 14)

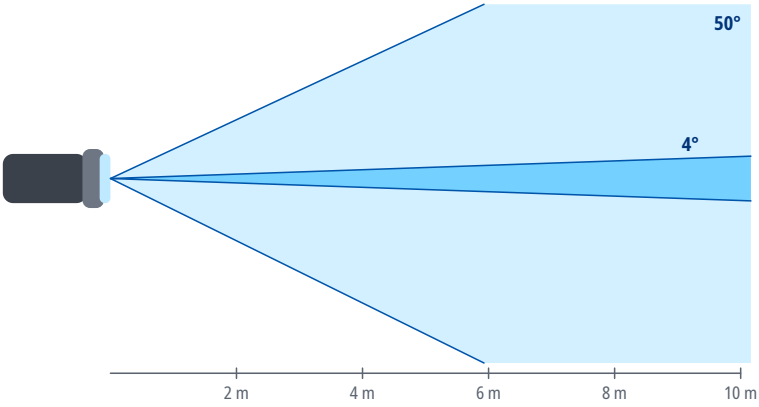
10 Technical specifications

Parameter	Value
Light	
Light source	LED
LED power	500 W
Luminous flux	24,000 lm
Color temperature	7,200 K
Color rendering index (CRI)	90
Optics	
Zoom	4–50°
Movement	
Pan	540°
Tilt	270°
Control	
DMX connection	5-pin XLR IN/OUT, 3-pin XLR IN/OUT
RJ45 connectors	RJ45 IN
RDM	yes (manufacturer ID 0x0843, device model ID 0xA111)
Electrical	
Power supply	110–240 V, 50/60 Hz
Power consumption	600 W
Power connectors	powerCON TRUE1 IN/OUT
Dimensions and construction	
Weight	23 kg
Operating environment	
Operating temperature	-20 to 40 °C

Speeds and ranges

Parameter	Value
Color wheel rotation	up to 180 °/s (30 rpm)
Gobo wheel 1 rotation	up to 180 °/s (30 rpm)
Gobo wheel 2 rotation	up to 180 °/s (30 rpm)
Gobo 2 rotation	up to 360 °/s (60 rpm)
Prism 1 rotation	up to 360 °/s (60 rpm)
Prism 2 rotation	up to 360 °/s (60 rpm)

Spot diameter



Distance	Ø 4°	Ø 50°
2 m	0.14 m	1.9 m
4 m	0.28 m	3.7 m
6 m	0.42 m	5.6 m
8 m	0.56 m	7.5 m
10 m	0.7 m	9.3 m
15 m	1 m	14 m

Spot diameter square to the beam axis, calculated from the beam angle.

11 Maintenance and cleaning

- Before cleaning and maintenance, switch the device off, disconnect it from the power supply and let it cool down.
- Clean the housing with a soft, dry or slightly damp cloth. Do not use solvents, abrasive cleaners or pressure washers, and make sure no liquid gets into the device.
- Clean optical parts (lenses, front glass), if the device has any, with a soft lint-free cloth and a cleaner intended for optics or glass.
- Regularly inspect the housing, cables, connectors and fixings. Have damaged parts replaced by a service center.
- How often to clean depends on the environment; dust, smoke and fog make the device dirty much faster.

12 Troubleshooting

Problem	Remedy
The device does not switch on	Check the supply voltage, the cables and the fuse, if the device has one.
The device does not respond to DMX	Check the start address, the selected DMX mode and whether it matches the profile in the controller, the cable connection to DMX IN, and the controller output (universe).
The device behaves erratically or flickers	Check the terminator at the end of the line, the condition and wiring of the cables (shield on pin 1 only), the number of devices on the line (32 at most), and that the line is not split without a splitter.

Problem	Remedy
Only some devices on the line respond	Check the cable and connectors between the last working and the first non-working device, and make sure all devices on the line are switched on.
Devices respond to the wrong channels or affect each other	Check that the addresses do not overlap and that the DMX mode on the devices matches the patch in the controller.
The device or the connected load does not light up although it receives DMX	Check the values of the dimmer, shutter and strobe channels against the DMX channel table. For the DMX modes for which the sources state it, the chapter DMX channels gives under the mode's heading which channels must be open.
Movement is reversed	Check whether Pan/Tilt inversion is enabled in the device menu or in the controller.
Moving parts do not reach the correct position after power-on or transport	Switch the device off and on again to reset the position, and make sure the transport lock, if any, is released. If this does not help, contact a service center.
Movement is jerky	Check the value of the Pan/Tilt speed channel, if the device has one, and the stability of the DMX signal.

13 Disposal

The crossed-out wheeled bin symbol on the product, in the manual or on the packaging means that the product must not be disposed of with unsorted household waste at the end of its life.

Take the end-of-life equipment to a collection point, for example a municipal collection site or a retailer. Proper disposal enables materials to be recycled and helps prevent possible negative effects on the environment and human health.

Follow the regulations applicable in your country; in the Czech Republic, take-back is governed by Act No. 542/2020 Coll., on End-of-Life Products.

Recycle the packaging materials according to their type.